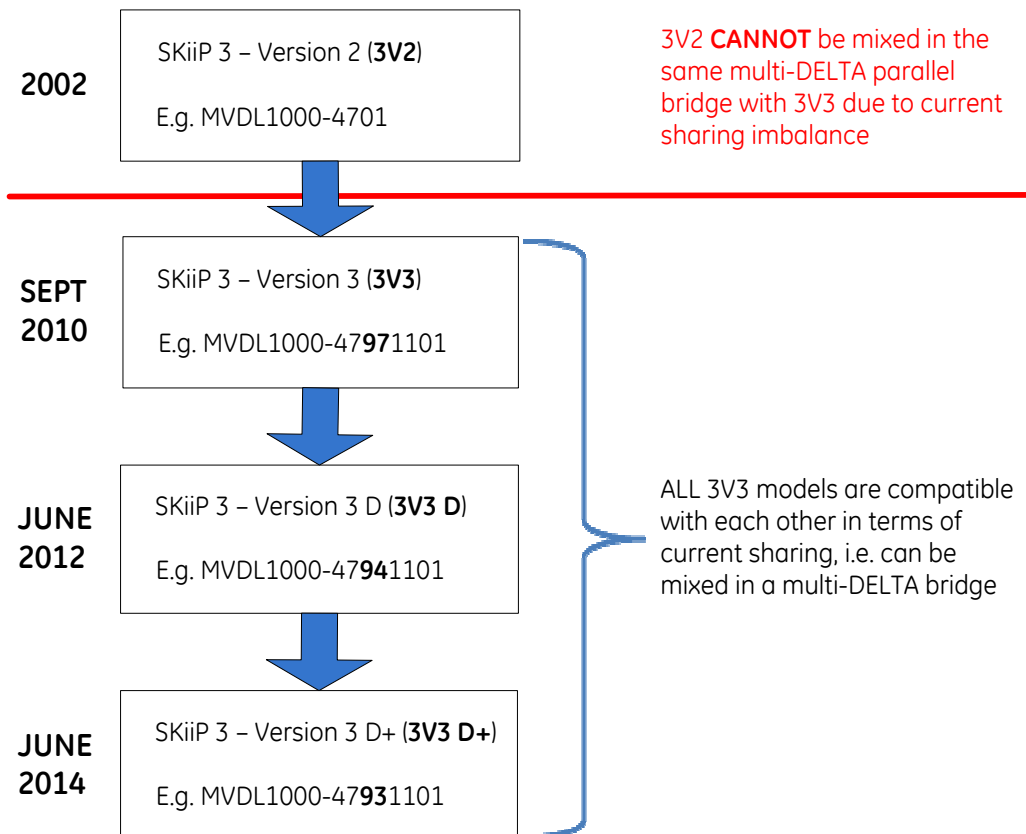


## Changes to MV3000 DELTA Part Numbers Due To New SKiiP® Module Enhancements

As part of on-going quality improvements, the main power devices (SKiiP® modules) used in MV3000 Liquid Cooled DELTA modules changed during 2014.

The new SKiiP® modules are fully compatible with the previous generation and can operate in parallel with existing parts so there are no issues to worry about for users. The changes represent enhancements/design improvements and improvements in the production and test processes from the manufacturer. The company needs to track the types of delta in service and so this necessitates a slight modification to the part number in order to reflect the change in the main power semiconductors in use.

### General Background – Evolution of SKiiP Types



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## SUMMARY OF THE CHANGES

The introduction of the 3V3 SKiiPs in 2010 represented a major change in both the layout of the silicon and its interconnections and some fundamental changes to the gate driver board electronics.

There were new spring electrical contacts and pressure pads on the power circuits; modification of main layout to give improved device current sharing; IGBTs moved to improve isolation performance, change of gate resistors to improve switching performance.

Changes were made to the gate drive electronics e.g. up-rated diodes; removal of potting compound in favor of conformal varnish; re-designed ESD covering; up-rating of electrolytic capacitors; improved immunity to noise bursts; change of driver transformer increased insulation and so on.

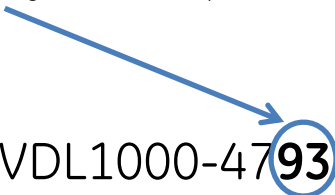
These changes meant that the new 3V3 would not current share with 3V2 and so the two types **CANNOT** be mixed.

The following enhancements made to 3V3 from 2012 onwards represented less fundamental changes but more subtle improvements. The 3V3 Version D had enhancements to the DC insulation foil system to increase environmental protection. The creepage distance on the DCB underneath the DC terminals was increased as well as subtle changes to the DC+ bus bar of the SKiiP.

The latest changes in 2014 centred on the introduction of “partial discharge free” ceramic material and the close selection and matching of the devices in terms of their donor silicon wafers. There is also increased testing.

## CHANGES TO DELTA PART NUMBERS

Two of the digits in the Delta part number represent the SKiiP type.



MVDL1000-47**93**1101

Numbers 97, 94 and 93 represent the three types of SKiiP 3V3 and are all interchangeable.

(You may come across Delta modules with “92” numbers in the future. These are Deltas using upgraded/refurbished SKiiP modules for retrofit/service exchange use).

The other numbers, representing current rating and other options – must be the same as your original delta of course.

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Global Supply Chain (Kidsgrove)

GE Power Conversion

2<sup>nd</sup> June 2014